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# 300 DESIGN CONDITIONS

Chapter 300 of the 90.1 Code specifies the outdoor and indoor design conditions that must be used for calculations called for in Chapter 400.

## Exterior Design Conditions (301.1)

Table 301.1 specifies the exterior design conditions. When the jurisdiction includes more than one city, Table 301.1 may be formatted with multiple columns. Data may also be taken from Chapter 24 of the ASHRAE Fundamentals Handbook (1985). The exterior design conditions are described below in three groups. The groups are established according to how the data are used.

**Load Calculations.** Outdoor design temperatures are used in performing the load calculations required by Section 403.2.1. The loads resulting from these calculations must be used to size HVAC systems and equipment. Table 301.1 specifies the following information.

- *Winter Design Dry-Bulb* (99%). This is the outdoor dry-bulb temperature used to calculate heating loads. The 99% means that, on average, the outdoor temperature will be above this temperature for 99% of the winter.
- *Summer Design Dry-Bulb* (2.5%). This is the outdoor dry-bulb temperature used to calculate cooling loads. The 2.5% means that, on average, the outdoor dry-bulb temperature will be above this temperature for only 2.5% of the summer.
- *Mean Coincident Wet-Bulb* (2.5%). This is the outdoor wet-bulb temperature used to calculate cooling loads. The 2.5% means that, on average, the outdoor wet-bulb temperature will be above this temperature for only 2.5% of the time.

**Duct Insulation.** The requirements for HVAC ducts located outdoors depend on heating and cooling degree days at base 65°F (see Table 403.2.9.2).

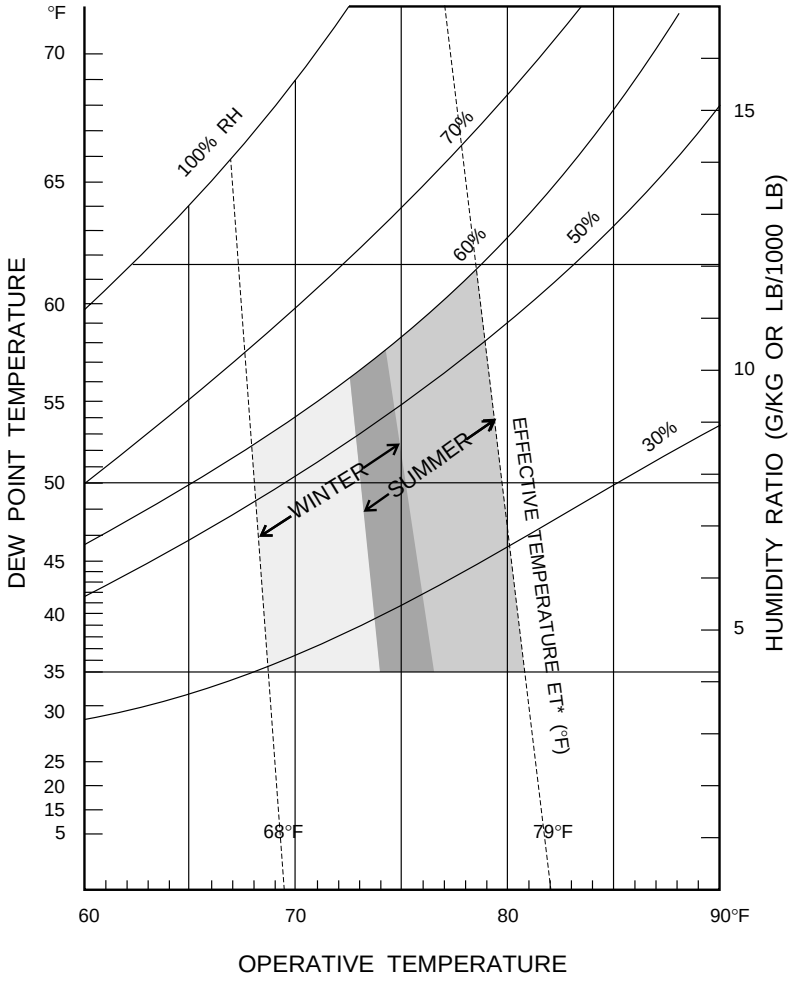
- Degree Days, Heating (Base 65°F)
- Degree Days, Cooling (Base 65°F)

**Economizers.** There is an exception to the requirement for integrated economizer controls (see Section 403.2.8) which is based on the number of hours each year between 8:00 a.m. and 4:00 p.m. when the temperature is between 55°F and 69°F. These data are available for the 234 cities listed in Table 402B and in Appendix C.

## Indoor Design Conditions (301.2)

The indoor design conditions used in load calculations must be consistent with the recommendations in ANSI[1]/ASHRAE Standard 55-1992, Thermal Environmental Conditions for Human Occupancy. Comfort depends on both the dry-bulb temperature and the amount of moisture in the air. The comfort envelope consists of all combinations of dry-bulb temperature and moisture for which most persons are comfortable. The envelope is specified separately for summer and winter and is shown in Figure 301A.

*Figure 301A The ASHRAE Comfort Envelope*




[1] American National Standards Institute